

SSBUV Solar Spectral Irradiance Data

The Shuttle Solar Backscatter Ultraviolet (SSBUV) instrument was the engineering model of the SBUV/2 profile ozone and total ozone instrument that has been flown by NOAA on polar-orbiting satellites since 1985. SSBUV was flown on the Space Shuttle eight times between 1989 and 1996. The primary purpose of SSBUV was to validate the SBUV/2 ozone data, using discrete measurements at 12 ultraviolet wavelengths between 252-340 nm. Further details about the SSBUV program can be found in Cebula et al. [1989] and Hilsenrath et al. [1993].

SSBUV also measured solar spectral UV irradiance data over the wavelength range 200-406 nm with a resolution of 1.1 nm. Solar spectral data were collected on multiple days during each Shuttle flight, with numerous measurement sequences taken each day. The SSBUV instrument was calibrated in the laboratory both before and after each flight, and additional onboard calibration measurements were made during each flight. As a result, the SSBUV solar UV spectra are very accurate. Further details about the SSBUV solar measurements can be found in Cebula et al.[1996] and references therein.

SSBUV solar spectral irradiance data are available for the following dates.

Flight #1: 1989 October 19, 20, 21.

Flight #2: 1990 October 7, 8, 9.

Flight #3: 1991 August 3, 4, 5, 6.

Flight #4: 1992 March 29, 31.

Flight #5: 1993 April 9, 11, 13, 15, 16.

Flight #6: 1994 March 14, 15, 17.

Flight #7: 1994 November 5, 7, 10, 13.

Flight #8: 1996 January 12, 16, 18.

A separate ASCII data file is available for each flight. Each file contains the wavelength scale (200-406 nm), average irradiance spectrum [mW/m²/nm] over the entire flight, and average irradiance spectrum for each day on which measurements were made. Differences between daily average spectra may include real solar activity variations, since these spectra may be separated by up to eight days within a given flight.

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References

Cebula, R. P., et al. (1989), Calibration of the Shuttle-borne Solar Backscatter Ultraviolet spectrometer, Proc. SPIE, 1109, 205-218.

Hilsenrath, E., et al. (1993), Calibration and radiometric stability of the Shuttle Solar Backscatter Ultraviolet (SSBUV) experiment, Metrologia, 30, 243-248.

Cebula, R. P., et al. (1996), Observations of the solar irradiance in the 200-350 nm interval during the ATLAS-1 mission: A comparison among three sets of measurements - SSBUV, SOLSPEC, and SUSIM, *Geophys. Res. Lett.*, 2